FORM MR-LMO
(Revised April 2005)

FOR DIVISON USE ONLY
File #: M/ 049/0084
Date Received:
DOGM Lead: Lynn cc: Peter
Permit Fee $_____ Ck # _____
Task: 5366

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
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RECEIVED
MAR 21 2013
DIV. OF OIL, GAS & MINING

NOTICE OF INTENTION TO COMMENCE LARGE MINING OPERATIONS

The informational requirements in this form are based on provisions of the Mined Land Reclamation Act, Title 40-8, Utah Code Annotated 1953, General Rules and Rules of Practice and Procedures.

This form applies only to mining operations which disturb or will disturb more than five acres at any given time.

"MINING OPERATIONS" means those activities conducted on the surface of the land for the exploration for, development of, or extraction of a mineral deposit, including, but not limited to, surface mining and the surface effects of underground and in situ mining, on-site transportation, concentrating, milling, evaporation, and other primary processing.

"Mining operation" does not include: the extraction of sand, gravel, and rock aggregate; the extraction of oil and gas as defined in Chapter 6, Title 40; the extraction of geothermal steam; smelting or refining operations; off-site operations and transportation; or reconnaissance activities which will not cause significant surface resource disturbance or involve the use of mechanized earth-moving equipment such as bulldozers or backhoes.

PLEASE NOTE: *This form is to be used as a guideline in assembling the information necessary to satisfy the Large Mining Operations Notice of Intention requirements.* ***You will need extra space to provide a majority of the information requested****. Please provide the information on additional sheets and include cross-referenced page numbers as necessary. The Permittee / Operator may submit this information on an alternate form; however, the same or similar format must be used.*

I. Rule R647-4-104 - Operator(s), Surface and Mineral Owners

The Permittee / Operator must provide the name, address and telephone number of the individual or company who will be responsible for the proposed operation. If a company is to be listed as the Permittee / Operator, then the name of the corporate officers need to be provided.

1. **Mine Name:** Black Shale & Rose Mine

2. **Name of Permittee/ Operator/ Applicant:** Pabco Building Products LLC, dba Interstate Brick

   Contact (Authorized Officer): Scott Weber

   Company ( ) Corporation (X) Partnership ( ) Individual ( )

   A corporation must be registered with the State of Utah, Division of Corporations. Are you currently registered to do business in the State of Utah? ▪ Yes ▪ No

   Business License # 5286582-0161

   Registered Agent (as identified on your business license): CT Corporation System
   Address: 50 W Broadway Ste 800
   Salt Lake City, UT 84101-2006
   Phone: 801.364.5101 Fax: 801.359.0388

3. **Permanent Address:** 9780 South, 5200 West
   West Jordan, UT
   84081
   Phone: 801.280.5200 Fax: 801.280.5245

4. **Company Representative** (or designated operator):

   Name: John Hewitt
   Title: Assistant Plant Manager
   Address: 9780 South, 5200 West, West Jordan Utah 84081
   Phone: 801.280.5230 Fax: 801.280.5245

5. **Location of Operation:**
   County(ies) Utah
   W 1/2 of S.E 1/4, Section: 36 Township: 6 S. Range: 1 W.
   _____ 1/4 of _____ 1/4, Section: _____ Township: _____ Range: _____
   _____ 1/4 of _____ 1/4, Section: _____ Township: _____ Range: _____

The names of the surface and mineral owners for any areas which are to be impacted by mining must be provided to the Division. This list should include all private, state and federal ownership and the owners of lands immediately adjacent to the project areas.

6. **Ownership of the land surface** (circle all that apply):
   Private (Fee), Public Domain (BLM), National Forest (USFS), State of Utah (SITLA) or other:

   Name: SITLA Address: 675 East 500 South, Suite 500 Salt Lake City, UT 84102
   Name: _____ Address: _____

Name: _____ Address: _____
Name: _____ Address: _____

7. **Owner(s) of record of the minerals to be mined** (circle all that apply):
Private (Fee), Public Domain (BLM), National Forest (USFS), State of Utah (SITLA) or other:

Name: SITLA Address: 675 East 500 South, Suite 500 Salt Lake City, UT 84102
Name: _____ Address: _____
Name: _____ Address: _____
Name: _____ Address: _____

8. **BLM Lease or Project File Number(s) and/or USFS Assigned Project Number(s):** none

BLM Claim Numbers: none

Utah State Lease Number(s): ML 7280 & ML 17637

Name of Lessee(s): Pabco Building Products LLC, dba Interstate Brick

9. **Adjacent land owners:**

Name: SITLA Address: 675 East 500 South, Suite 500, Salt Lake City, Utah 84102 Phone: 801-538-5100
Name: BLM Address: Salt Lake Field Office 2370 South 2300 West Salt Lake City, UT 84119
Name: _____ Address: _____
Name: _____ Address: _____

10. **Have the land, mineral and adjacent land owners been notified in writing?**
Yes yes No _____

If no, why not? _____

11. **Does the Permittee / Operator have legal right to enter and conduct mining operations on the land covered by this notice?** Yes yes No _____.

II. **Rule R647-4-105 - Maps, Drawings & Photographs**

105.1 - Base Map

A complete and correct topographic base map (or maps) with appropriate contour intervals must be submitted with this notice showing all of the items on the following checklist. The scale should be approximately 1 inch = 2,000 feet (preferably a USGS 7.5 minute series or equivalent topographic map where available). The map(s) must show the location of lands to be affected in sufficient detail to allow measurement of the proposed area of surface disturbance.

Base Map Checklist

Please check off each section to verify these features are included on the map(s) or explain why it is not applicable. Please add the map identification name or number which shows these features.

Check			Legend ID
√	(a)	Property boundaries of surface ownership of all lands which are to be affected by the mining operations;	
		SITLA Clay Lease ML 7280	1
		SITLA Clay Lease ML 17637	2
	(b)	Perennial, intermittent, or ephemeral streams: springs and other bodies of water:	
		South Water Retention Ponds associated with seep.	3A
		North Water Retention Pond associated with seep	3B
		Ephemeral Seeping Drainage Associated with Seeps	4
		Roads – Existing unimproved roads in and within 500 feet of mine area	5
		Buildings – none	
		landing strips – none	
√		electrical transmission lines...Transmission Lines that pass through ML 7280 through Enoch Canyon	6
		water wells - the nearest known well for dept of groundwater estimate ...	7
		oil and gas pipelines	None
		existing wells or boreholes	None
		or other existing surface or subsurface facilities within 500 feet of the proposed mining operations;	None
	(c)	Proposed route of access to the mining operations from nearest publicly	
√		maintained highway (Map scale appropriate to show access);	8
√	(d)	Known areas which have been previously impacted by mining or exploration activities within the proposed land affected;	
		Previously Distrubed Areas - Pre Law – 19 acres	9
		Disturbed Area, Non Pre-law – 5 acres	9A
√	(e)	Areas proposed to be disturbed or reclaimed over the life of the project or other suitable time period	
		Black Shale Mine Area proposed to be impacted over the life of the project	11
		Rose Mine Area to be impacted over the life of the	

105.2 - Surface Facilities Map

Surface Facilities Map Checklist

Surface facilities maps should be provided at a scale of not less than 1" = 500'.

Please check off each section to verify these features are included on the map(s) or explain why it is not applicable. Please add the map identification name or number which shows these features.

SURFACE FACILITIES MAP – Check

√	(a)	Proposed surface facilities, including but not limited to:	Legend ID
		buildings – No buildings associated with this mining.....	n/a
		stationary mining/processing equipment – No stationary mining/processing equipment.....	n/a
		Roads	
		Connector Road Between Black Shale Pit and Rose Pit.....	1
		Existing Black Shale Access road to Hwy 68.....	2
		Utilities - no utilities associated with this mining operation.....	n/a
		power lines.....no power lines are within the proposed permitted area.....	n/a
		proposed drainage control structures	
		water retention berms to retain water.....	3
		Existing ponds associated with springs to not be disturbed in future mining.....	3A

location of topsoil storage areas

Type of Storage Area	Estimated CY	Legend ID
Existing Prior Mining Growth Media Pile	4,981	4-#1
" " " " " "	1,660	4-#2
" " " " " "	1,557	4-#3
" " " " " "	2,936	4-#4
" " " " " "	3,162	4-#5
" " " " " "	1,958	4-#6
Future Growth Media storage area	2,447	5-#1
" " " " "	4,894	5-#2
Total	**23,595**	

overburden/waste dumps - no waste associated with this mining. All overburden will be redistributed as growth media. See topsoil storage areas..... n/a

tailings or processed waste facilities - no tailings or waste facilities associated with this mining..... n/a

disposal areas for overburden - see topsoil storage areas. All overburden is suitable for use in re-contouring and as growth media after mining..... n/a

solid and liquid wastes, and wastewater discharge - no wastes or waste water discharge associated with this mining n/a

treatment and containment facilities - none associated with this mining n/a

√ (b) A border clearly outlining the extent of the surface area proposed to be affected by mining operations, and the number of acres proposed to be affected

Description	Acres	Legend ID
Proposed Permit Area Boundary	48	9
Extent of Surface Area to be affected by mining	25.6	7

Areas within Surface area to be affected	Acres	Total acres	Lengend ID
Features included within areas of mining:			
Areas requiring topsoil removal	5.4		9
Existing topsoil piles from prior mining	4.5		4
Areas of Mining where topsoil has already been removed	2.7		
Total Areas of Mining		13	6
Additional New topsoil storage area. (5-#2)		1.3	5

Drainage Retention Pond		.3	3A
Topsoil Storage Areas outside Areas of Mining (Map ID 7).		1.2 .4 .8 1.1	4-#1 4-#3 4-#4 4-#5
Roads and other areas within total mine area not covered by features above.		7.5	
Total		25.6	

√ (c) The location of known test borings, pits, or core holes

Description	Acres	Legend ID
Known existing pits, excavations, and/or disturbed areas from previous mining activity		
Previously Distrubed Areas - Pre-Law Distrubed Area - Non-Pre Law	19 5	8 8A

105.3 - Additional Maps

Reclamation Treatments Map Checklist - Check

Please check off each section to verity these features are included on the map(s) or explain why it is not applicable. Please add the map identification name or number which shows these features.

Check — Legend ID

√ (a) Areas of the site to receive various reclamation treatments shaded, cross hatched or color coded to identify which reclamation treatments will be applied. Areas would include:

Buildings..... n/a

stationary mining/processing equipment..... n/a

Roads.....Roads to be recontoured, ripped, seeded..... 1

Utilities..... n/a

proposed drainage improvements or reconstruction and sediment control structures...none required with reclamation revegetation.

topsoil storage areas
(see table below)

waste dumps...no waste dumps associated with this mining.

tailings or processed waste facilities..no tailings ore processed waste associated with this mining.
disposal areas for overburden
All overburden piles are growth media for redistribution. See table below.
solid and liquid wastes
No solid or liquid wastes generated by this mining.
ponds and wastewater discharge
Existing ponds associated with springs to not be disturbed in future mining..... 3A-#1 & 3A-#2
treatment and containment facilities

Reclamation treatments may include ripping, regrading, replacing soil, fertilizing, mulching, broadcast seeding, drill seeding, and hydroseeding:
Reclamation Treatments

Description	Acres	Legend ID
Roads to be Ripped and Seeded	6.8	1
Existing Stockpiles from Prior Mining Activity to be Re-contoured after material removed for redistribution, ripped, and seeded	1.2	4-#1
"	.6	4-#2
"	.4	4-#3
"	.8	4-#4
"	1.1	4-#5
"	.4	4-#6
Stock Pile Storage Area Associated with Future Mining to be ripped and seeded	.6	5-#1
"	.7	5-#2
Previously Mined Portion of the Black Shale Mine	2.8	6-#1
Areas that have been previously mined, or top soil was removed in preparation for mining - Rose mine	3.8	6-#2
Future Black Shale Mine Area to be contoured covered in growth media and seeded	2.1	6-#3
Future Rose Mine area to be contoured, covered in growth media and seeded	1.1	6-#4
"	3.2	6-#5
Total of Above Areas	25.6	n/a
Outline of Total Reclamation Area	25.6	7

√ (b) A border clearly outlining the extent of the area to be reclaimed after mining, the number of acres disturbed, and the number of acres proposed for

reclamation:

Description	acres	Map ID
Outline of total area to be reclaimed and proposed area of reclamation	25.6	7
Outline of existing areas disturbed over the life so far of this mine area. Parts of this area outside indicated treatments have re-vegetated themselves and are proposed to have met reclamation standards	23	8
Proposed permit area boundary	48	9

____ (c) Areas disturbed by this operation which are included in a request for a variance from the reclamation standards: n/a

10

_____ (d) High walls which are proposed to remain steeper than 45 degrees and slopes which are proposed to remain steeper than 3 horizontal : 1 vertical. n/a

10

Note: Areas included in sections c & d will need to be referenced in the variance request section. Please shade or color code these areas on this map.

Additional maps and cross sections may be required in accordance with Rule R647-4-105.3. Design drawings and typical cross-sections for each tailings pond, sediment pond, or other major drainage control structures must also be included.

III. Rule R647-4-106 - Operation Plan

106.1 - Mineral(s) to be mined: Clay & Shale for Brickmaking

106.2 - Type of Operation Conducted:

Describe the typical methods and procedures to be used in mining operations, on-site processing and concurrent reclamation. Include equipment descriptions where appropriate.

An excavator (typically a CAT 330-345 or equivalent) digs clay from a clay seam that starts just typically just below the top soil, and is sometimes located between layers of limestone, usually 1-5' thick. Topsoil overburden is removed as needed and placed as close

and convenient as possible for redistribution over the clay excavation when mining is completed.

One or two 35 ton capacity rock trucks transport the clay to a stockpile on the mine site. Stock piles of the Clay and Shale are not expected to exceed 30,000 tons each, or 20,000 cubic Yards.

Each mining event typically lasts three weeks to a month and a half. Enough clay is mined at the site to build a two year stockpile of clay, so mining is planned for every other year.

Due to slippery and mud making the nature of wet clay, mining and hauling takes place during times of the year when the ground and the clay are dry and not during wet rainy periods.

A dozer may also be used depending on the clay deposit for moving clay and/or redistributing overburden in previously mined areas.

The angle of the slope of the bank of clay bank is maintained at a maximum 1:1 for safety. If necessary a vehicle barrier or berm is placed at the top of edge of the excavation and roads into the excavation are blocked with rocks and or earth berms for safety.

A rubber tired loader loads clay from the stockpile into highway clay haul trucks for transport to Interstate Brick's West Jordan plant when needed.

There is no onsite processing, structures, or utilities.

All overburden/topsoil is strategically placed so that it can later redistributed over the excavated area with minimum effort or redistributed in a previously mined area for concurrent reclamation. There is no waste materials associated with this mining - all material is either clay that is hauled to the plant and used for brick-making or is top soil and rock overburden that is redistributed as growth medium during reclamation.

106.3 - Estimated Acreage

Acreage listed here should match areas measured off the maps provided.

	Acres	Map	Legend ID
Areas of actual mining:	13	Surf. Facilities	6-#1 - 6-#5
Overburden/waste dumps:	4.5 existing 1.3 new	Surf. Facilities	4-#1 - 4-#6 5-#1 & 5-#2
Ore and product stockpiles*:	1.1	Surf. Facilities	5A-#1 & 5A-#2
Access/haul roads:	6.8	Rec.Treatments	1
Associated on-site processing facilities:	none	n/a	n/a
Tailings disposal:	0	n/a	n/a
Other - Please describe:	-1.1	Stockpiles 5A-#1 & 5A-#2 are over top other areas	

Total Acreage 25.6 acres

*The "Ore and Product Stockpiles" areas are not counted in the total above because they are within other areas (5A-1 is within area 4-#5 & 5A-#2 is within area 6-#1).

106.4 - Nature of material including waste rock/overburden and estimated tonnage

Describe the typical annual amount of the ore and waste rock/overburden to be generated, in cubic yards. Where does the waste material originate? What is the nature of the overburden/wastes (general chemistry/mineralogy and description of geologic origin)? Will it be in the form of fines or coarse material? What are the typical particle size and size fractions of the waste rock?

Thickness of overburden:	13" ft.	
Thickness of mineral deposit:	5 - 30 ft.	
Estimated annual volume of overburden:	1,888 cu. yds.	9,438 CY (tot. new OB) / 5 yrs.
Estimated annual volume of tailings/reject materials:	0 cu. yds.	No tailings associated with this mining because no processing. All Overburden reused in reclamation.
Estimated annual volume of ore mined:	20,000 cu. yds.	

Overburden/waste description: see vegetation study

106.5 - Existing soil types, location of plant growth material

Specific information on existing soils to be disturbed by mining will be required. General soils information may not be sufficient.

Provide specific descriptions of the existing soil resources found in the area. Soil types should be identified along with depth and extent, especially those to be directly impacted by mining.

Soils - The plan shall include an Order 3 Soil Survey (or similar) and map. This information is needed to determine which soils are suitable for stockpiling for revegetation. This soil data may be available from the local Natural Resources Conservation Service office, or if on public lands, from the land management agency. The map needs to be of such scale that soil types can be accurately determined on the ground (see Attachment I).

(a) Each soil type to be disturbed needs to be field analyzed for the following:

Depth of soil material 6.8 inches

Volume (for stockpiling) 16,254 cu. yds. (existing)
7,341 cu. Yds. (future)
Total: 23,595 cu. Yds.

Deleted: 13

Texture (field determination) _____

pH (field determination) _____

(cross reference with item 106.6)

Table of Areas of salvageable topsoil

Type of Storage Area	Acres	Legend ID
Existing Prior Mining Growth Media Pile	1.2	4-#1
" " " " " "	.6	4-#2
" " " " " "	.4	4-#3
" " " " " "	.8	4-#4
" " " " " "	1.1	4-#5
" " " " " "	.4	4-#6
Top Soil from Future Mine Area	2.1	6-#3
" " " " " "	1.1	6-#4
Total	7.7	

(b) Where there are problem soil areas (as determined from the field examination) laboratory analysis may be necessary. Soil samples to be sent to the laboratory for analysis need to be about one quart in size, properly labeled, and in plastic bags. Each of the soil horizons on some sites may need to be sampled. Soil sample locations need to be shown on the soils map. Soil analysis for these samples should include: texture, pH, Ec (conductivity), CEC (Catoin Exchange Capacity), SAR, % Organic Matter, Total N, Available Phosphorus (as $P_2 0_5$), Potassium (as $K_2 0$), and acid/base potential.

106.6 - Plan for protecting and redepositing existing soils

Thickness of soil material to be salvaged and stockpiled: 13 inches

Area from which soil material can be salvaged: (show on map)

5.4 acres

Volume of soil to be stockpiled: 23,595 cu. yds.
(cross reference with item 106.5 (a))

Describe how topsoil or subsoil material will be removed, stockpiled and protected.

106.7 - Existing vegetative communities to establish revegetation success

Vegetation - The Permittee / Operator is required to return the land to a useful condition and reestablish at least 70 percent of the premining vegetation ground cover.

Provide the Division with a description of the plant communities growing onsite and the percent vegetation cover for each plant community located on the site. Describe the methodology used to obtain these values.

The percent ground cover is determined by sampling the vegetation type(s) on the areas to be mined (see Attachment I for suggested sampling methods).

(a) Vegetation Survey - The following information needs to be completed based upon the vegetation survey:

Sampling method used transects @ 100 feet each

Number of plots or transects (10 minimum) 6

Ground Cover	Percent
Vegetation (perennial grass, forb and shrub cover)	50
Litter	29
Rock/rock fragments	12
Bare ground	9
	100%

Revegetation Requirement
(70 percent of above vegetation figure) 35% %

Indicate the vegetation community(ies) found at the site.

List the predominant perennial species of vegetation growing in each vegetation community type.

See Baseline Vegetation and Soil Assessment at Black Shale Mine, December 19, 2006,

(b) Photographs - The Permittee / Operator may submit photographs (prints) of the site to show existing vegetation conditions. These photographs should show the general appearance and condition of the area to be affected and may be utilized for comparison upon reclamation of the site. Photographs should be clearly marked as to the location, orientation and the date they were taken.

106.8 - Depth to groundwater, overburden material & geologic setting

Describe the approximate depth to groundwater in the vicinity of the operation based on the completion of any monitoring or water wells in the area. Please show the location of these wells on the base map.

Depth to groundwater 0 ft.

There is a spring at the pond on the eastern side of the mine. There is a slight overflow from the pond on the eastern side that which down Seep Canyon beside the road.

Provide a narrative description of the geology of the area and/or a geologic cross section.

106.9 - Location and size of ore and waste stockpiles, tailings and treatment ponds, and discharges

Describe the location and size of any proposed waste/overburden dumps, stockpiles, tailings facilities and water storage or treatment ponds.

Describe how overburden material will be removed and stockpiled.

Describe how tailings, waste rock, rejected materials, etc. will be disposed of.

Describe the acreage and capacity of waste dumps, tailings ponds and water storage ponds to be constructed. All impoundments must include the necessary hydrologic calculations to determine if they are adequately sized to handle storm events.

Describe any proposed effluent discharge points (UPDES) and show their location on the surface facilities map. Give the proposed discharge rate and expected water quality. Attach chemical analyses of such discharge if available.

IV. R647-4-107 - Operation Practices – This Section no longer applies to this form

V. Rule R647-108 - Hole Plugging Requirements

All drill holes which will not eventually be consumed by mining must be plugged according to the methods listed in this section. Describe the location of any aquifers encountered by drilling and the method to be used to plug such water containing holes. Describe the method to be used for plugging holes not containing water.

No holes will be drilled and no holes exist from prior activities.

VI. Rule R647-109 - Impact Statement

109.1 - Surface and groundwater systems

Describe impacts to surface or groundwater which could be caused by this mining operation. Describe how these impacts will be monitored and mitigated. The appropriate groundwater and stormwater control permits need to be obtained from the Division of Water Quality. Please reference any such permits.

No impacts to ground water are anticipated. At present most of the surface water from rain and snow melt remains on sight except for overflow from the ponds that drain down Seep Canyon. The two ponds are fed by two seeps, and this is probably where the name Seep Canyon (listed on the USGS topo) comes from. Even though the USGS topo map indicates a spring, Sagebrush Consultants verbally conveyed to the author of this plan that they do not consider this a spring. In the summer the overflow to these ponds, feed by the seeps, has been observed to not overflow. On the Black Shale side the ponds are located at the based of the clay excavated clay face. This situation would remain and the pond would serve as a catch basin for rain and

snow runoff from the exposed clay. Water running over the clay face does not form acidic water. Treatment consists of holding the water on site in a catch basin to allow suspended clay if present to settle out. Since these ponds would remain at the basin of the future mining there is not expected to be any more runoff than already occurs. On the Rose Side a catch basins can also be formed by small berms and a slightly lower elevation of the foot-of-the-mine-face floor to hold the water that runs off the mine face from rain and snow melt.

109.2 - Wildlife habitat and endangered species

Describe the impacts on wildlife habitat associated with this operation. Describe any impacts to big game species found in the area. Describe any impacts to riparian areas. Describe any impacts this operation will have on waterfowl (fly-over, temporary resident or permanent resident). List any threatened or endangered wildlife species found in the area. Describe impacts to threatened or endangered species and their habitats. Describe measures to be taken to minimize or mitigate any impacts to wildlife or endangered species.

Since mining will produce no slopes significantly steeper than what is already there, and since the present state will not be significantly altered from what it is at present, **These operations will not have any impact on wildlife in the area.** This is not a riparian area.

109.3 - Existing soil and plant resources

Describe impacts to the existing soil and plant resources in the area to be affected by mining operations. Describe impacts to riparian or wetland areas which will be affected by mining. Describe impacts to threatened or endangered plant species. Describe measures to be taken to minimize or mitigate any impacts to soil and plant resources.

Since topsoil removed in prior mining has been stockpiled and identified, it will be redistributed at the completion of the project. **Re-seeding will restore the vegetation to an ecologically stable condition suitable for the postmining land use.**

Deleted: Re-seeding will restore the vegetation to the natural surrounding state so there will be adverse impact.

109.4 - Slope stability, erosion control, air quality, public health & safety

Describe the impacts this mining operation will have on slope stability, erosion, air quality, public health and safety. Include descriptions of highwall and slope configurations and their stability. Air quality permits from the Utah Division of Air Quality may be required for mining operations. Please reference any such permits. Describe measures to be taken to minimize or mitigate impacts to slope stability, erosion, air quality, or public health and safety.

The present Rock will from previous mining is stable. Regraded slopes will be no more than 2H:1V and will be 3H:1V if

possible. No erosion patterns presently exist and future mining will not alter the present drainage patterns.

For safety all slopes will be maintained at a maximum between 1H:1V and 2H:1V.

VII. Rule R647-4-110 - RECLAMATION PLAN

110.1 - Current land use and postmining land use

Current or premining land use(s) [other than mining]: wildlife habitat

List future post-mine land-use(s) proposed: wildlife habitat

(Develop the reclamation plan to meet proposed post-mine land use.)

110.2 - Reclamation of roads, highwalls, slopes, leach pads, dumps, etc.

Describe how the following features will be reclaimed: roads, highwalls, slopes, impoundments, drainages and natural drainage patterns, pits, ponds, dumps, shafts, adits,8 drill holes and leach pads. Describe the configuration of these features after final reclamation. Describe the rinsing and neutralization of leach pads associated with final decommissioning.

Describe how roads will be reclaimed. Road reclamation may include: regrading cut and fill sections, ripping the road surface with a dozer, topsoil replacement, construction of water bars, construction of traffic control berms or ditches, and reseeding.

Top soil will be replaced from the cut and fill sections. Cut and fill sections will be minimized as the road will follow the natural contour of the land as much as possible. Reclamation of the road will consists of redistributing any cut and fill material to restore the natural contour of the land. The area will be ripped to prepare a seed bed.

Describe how highwalls will be reclaimed. Highwall reclamation may include: drilling and blasting, backfilling, regrading, topsoil replacement, and reseeding.

If a potential for a high wall forms due to a limestone layer the limestone will be removed or pushed over so the slope will not exceed 1:1. This applies to the Rose side. No highwalls situations will occur on the Black Shale side because there are no limestone walls.

Describe how slopes will be reclaimed. Slope reclamation may include: regrading to a 3 horizontal : 1 vertical (3h:1v) configuration, topsoil replacement, contour ripping, pitting, and reseeding.

Slopes will be graded then topsoil will be distributed over them with contours perpendicular to the slope and seeded. Regrading will be to 3h:1v and not to exceed 2h:1v.

Describe how impoundments, pits and ponds will be reclaimed. Include the final elevations and final disposition of the drainage in and around the impoundment. If the impoundment, pit, or pond is intended to be left as part of the post-mining land use, then an agreement with the land managing agency/owner is required. Structures to remain must be left in a stable condition.

The two small ponds will be left in place. No water impoundments will be left. Since all slopes will be re-vegetated there will be no deleterious effects from storm water run-off. The water retention berms, where necessary, which will only be 1-2 feet high, will be redistributed to match the natural contour when the seed bed is prepared.

Include the final size of the impoundment, pit, pond in acre-feet of storage and the capacity of the spillway to safely pass storm events.

The shallow ponds to be left in place are not impoundments.

Impoundments, pits, and ponds, which are not approved as part of the post mining land use shall be reclaimed, free draining, and the natural drainage patterns restored.

Describe how drainages will be reclaimed. Drainage reclamation would include: the reestablishment of a natural drainage pattern which fits in with the upstream and downstream cross-section of existing drainage in the vicinity of the disturbance; the reestablishment of a stable channel in the reclaimed reach of channel, using the necessary armoring to prevent excessive erosion and downstream sedimentation.

The present drainage occurs without erosion and these mining and reclamation activities will not significantly alter the pattern.

Include cross-sections and profiles of reestablished channels to demonstrate compatibility with existing drainage characteristics.

No present channels will be significantly altered in this mining or have to be reestablished.

Describe how waste dumps will be reclaimed. Waste dump reclamation may include regrading to a 3h:1v configuration, topsoil replacement, mulch or biosolids applications, contour ripping or pitting, and reseeding. Characterization of the physical and chemical nature of the waste dump materials should be provided.

There are no waste dumps or rock piles associated with this mining.

Describe how shafts and adits will be reclaimed. Reclamation of shafts may include: backfilling, installation of a metal grate, installation of a reinforced concrete cap, topsoil replacement and reseeding. Reclamation of adits may include: backfilling, installation of a block wall, installation of a metal grate, topsoil replacement and reseeding.

This mining does not include shafts or audits and there are none at the site.

Describe how drill holes will be reclaimed. Drill hole reclamation must be consistent with the rules for plugging drill holes (R647-4-108). Reclamation of plugged drill holes may include topsoil replacement and reseeding.

There are no existing drill holes in the area and no drilling is being requested in this permit and no holes have been found at the site.

Describe how tailings areas will be reclaimed. Tailings reclamation may include: dewatering, neutralization, placement of cap materials, placement of subsoil materials, topsoil replacement and reseeding. Characterization of the physical and chemical makeup of the tailings material should be provided.

This mining does not produce tailings area.

Describe how leach pads will be reclaimed. Reclamation of leached materials may include: neutralization or leached materials, rinsing of leached materials, dewatering leached materials, regrading slopes of leached materials to 3h:1v, extending pad liners, placement of capping materials, placement of subsoil materials, mulch or biosolids application, topsoil replacement and reseeding. Characterization of the physical and chemical makeup of the leached materials should be provided. Post closure monitoring and collection of drain down fluids should also be addressed.

This mining does not use leach pads.

NOTE: The Minerals Rules require overall highwall angles of no more than 45° at final reclamation unless a variance is granted. All dump or fill slopes should be left at an angle of 3h:1v or less. Any slopes steeper than 3h:1v must be reclaimed using state-of-the-art surface stabilization technology. Pit benches exceeding 35 feet in width should be topsoiled, or covered with fines, and revegetated.

Describe the final disposition of any stockpiled materials on site at the time of final reclamation.

Any growth media piles with material left will be countoured ripped and seeded.

110.3 - Surface facilities to be left

Describe any surface facilities which are proposed to remain on-site after reclamation (buildings, utilities, roads, drainage structures, impoundments, etc.). Describe their

post-mine application. *Justification for not reclaiming these facilities must be included in the variance request section.*
None. The two ponds on the black shale side will be left since they are an established wetland area with cattails growing in them, and will benefit wildlife and fit the "wildlife habitat" goal of the reclamation.

110.4 - Treatment, location and disposition of deleterious materials

Describe the nature and extent of any deleterious or acid forming materials located on-site. Describe how these materials will be neutralized, removed, or disposed of on site. Describe how buildings, foundations, trash and other waste materials will be disposed of.

This mining will not generate and/or leave behind any deleterious or acid forming materials. All overburden removed access the clay will be placed for redistribution and/or used in the reclamation contouring and as growth medium material for revegetation. Since this mining does not use buildings or foundations these do not need to be disposed of. Trash and any other waste materials associated with mining activity is taken offsite for disposal daily.

110.5 - Revegetation planting program and topsoil redistribution

Describe the revegetation tasks to be performed in detail. For example, will ripping, mulching, fertilizing, seeding and scarifying of these areas be performed and if so, how will this be accomplished? Correlate this information with the Reclamation Treatments Map.

a) Soil Material Replacement

In order to reestablish the required ground cover, one to two feet (depending on underlying material) of suitable soil material usually has to be redistributed on the areas to be reseeded. If the stockpiled soil isn't sufficient for this, soil borrow areas will need to be located.

All the topsoils from all the mining that has occurred has been located and identified and no additional soil will be needed.

Describe the volume of soils and approximate depth of soil cover to be used in reclamation. Describe the source of these soils and provide an agronomic analysis of the soils. If soils will not be used describe the alternative material or amendments to be applied in lieu of soils. Describe the methods used to transport and place soils.

The volume of soils should give an approximate coverage dept. of 13.5" These are all original soils. The estimated volumes of the existing top soil piles that have been located and volumes estimated (Surface Facility Map Legend Items 4-#1 through 4-#6) is 16,254CY. The expected volume of topsoil recovered from future mining (Surface Facility map Legend ID 5-

#1 & 5#2) is 7,341CY. The total volume of topsoil available should be 23,595 CY. The area of the five mine areas (Surface Facility Map Legend ID 6-#1 through 6-#1) sums up to 13 acres. Converting cubic yards to to cubic feet and acres to square feet gives 637,035 cf of topsoil divided by 566,280 square feet of area to be covered. This equals 1.225 feet or an average dept of 13.5 inches.

b) Seed Bed Preparation

Describe how the seedbed will be prepared and equipment to be used.
The Division recommends ripping or discing to a minimum of 12 inches and leaving the seed bed surface in as roughened condition as possible to enhance water harvesting, erosion control and revegetation success. Compacted surfaces such as roads and pads should be deep ripped a minimum of 18 inches.

The trackhoe and dump truck will be used to redistribute the topsoil piles. A dozer with rippers will spread and make furrows. The surface will be left in as rough a condition as possible, mixed with the rocks, with furrows running perpendicular to the fall of the hill to hold moisture and minimize erosion until the vegetation gets established.

Deleted: and

Deleted: contour them.

Deleted: The trackhoe will then roughen and rake the loose soil around leaving grooves along the contour lines.

The seeding method will be hand broadcast in fall.

c) Seed Mixture - List the species to be seeded:

Provide a seed mix listing adaptable plant species and the rate of seeding that will be used at the site for reclamation. More than one seed mix may be needed, depending upon the areas to be reclaimed. Keep the proposed post-mining land use in mind when developing seed mixes.

Example

Species Name	Common Name	Seeding Rate (lbs Pure Live Seed/Acre)
Agropyron cristatum	Crested Wheatgrass	0.5
Agropyron elongatum	Tall wheatgrass	2.5
Agropyron smithii	Western wheatgrass	2.5
Agropyron intermedium	Intermediate wheatgrass	2.0
Pao sandbergii	Sandberg bluegrass	0.3
Penstemon palmerii	Palmer penstemon	0.5
Aster chilensis	Pacific aster	0.1
Linum lewisii	Lewis flax	1.0
Melitotus officinalis	Yellow sweet clover	0.5
Artemisia tridentate var. vaseyana	Mountain big sagebrush	0.2
Chrysothamnus nauseosus	Rabbitbrush	0.5

Kochia prostrate	Forage Kochia	0.5
Purshia tridentate	Bitterbrush	2.0

Total lbs/acre 11.1

(The Division recommends seeding 12-15 lbs./acre of native and introduced adaptable species of grass, forb, and browse seed for drill seeding and 15-20 lbs./acre for broadcast or hydro seeding. The Division can provide assistance in developing reclamation seed mixes if requested).

Interstate Brick will use a seed mix listed in the Vegetation Study or as mixture recommended by the Division.

d) Seeding Method

Describe method of planting the seed.
The Division recommends planting the seed with a rangeland or farm drill. If broadcast seeding, harrow or rake the seed 1/4 to . inch into the soil. Fall is the preferred time to seed.

Seeding will take place in the fall for maximum chance of taking hold.

e) Fertilization

Describe fertilization method, type(s) and application rate (if needed).

Hopefully no Fertilization will be required based on the amount of natural revegetation that has occurred on the top-soil piles from prior mining. If so it will consist of organic material only for the benefit of the seeds planted so as to not to provide nutrients that will result in unwanted competition from undesired opportunistic weeds that would benefit from and out compete native plant species.

f) Other Revegetation Procedures

Please describe other reclamation procedures, such as mulching, biosolids application, irrigation, hydroseeding, etc., that may be planned.

VIII. **Rule R647-4-112 VARIANCE**

The Permittee / Operator may request a variance from Rules R647-4-107 (Operation Practices), R647-4-108 (Hole Plugging), and R647-4-111 (Reclamation Practices) by submitting the following information:

No Variance is being requested

1.11 the rule(s) which a variance is requested from; (rule number and content)

1.12 a description of the specific variance requested and a description of the area affected by the variance request; show this area on the Reclamation Treatments Map(s).

1.13 justification for the variance;

1.14 alternate methods or measures to be utilized in the variance area.

Variance requests are considered on a site-specific basis. For each variance requested, attach a narrative which addresses the four items listed above.

IX. Rule R647-4-113 - SURETY

A Reclamation surety must be provided to the Division prior to final approval of this application. In calculating this amount, include the following major tasks:

1) Clean-up and removal of structures.
2) Backfilling, grading and contouring.
3) Soil material redistribution and stabilization.
4) Revegetation (preparation, seeding, mulching).
5) Safety gates, berms, barriers, signs, etc.
6) Demolition, removal or burial of facilities/structures, regrading/ripping of facilities areas.
7) Regrading, ripping of waste dump tops and slopes.
8) Regrading/ripping stockpiles, pads and other compacted areas.
9) Ripping pit floors and access roads.
10) Drainage reconstruction.
11) Mulching, fertilizing and seeding the affected areas.
12) General site clean up and removal of trash and debris.
13) Removal/disposal of hazardous materials.
14) Equipment mobilization.
15) Supervision during reclamation.

To assist the Division in determining a reasonable surety amount, please attach a reclamation cost estimate which addresses each of the above steps. The areas and treatments included in the reclamation treatments map should correspond with items included in the reclamation cost estimate. The reclamation costs used by the Division must be third party costs.

X. PERMIT FEE [Mined Land Reclamation Act 40-8-7(i)]

The Utah Mined Land Reclamation Act of 1975 [40-8-7 (I)] provides the authority for the assessment of permitting fees. Commencing with the 1998 fiscal year (July 1 - June 30), **and revised July 1, 2002,** annual permit fees are assessed to new and existing notices of intention and annually thereafter until the project disturbances are successfully reclaimed by the Permittee / Operator and released by the Division.

Large mining permits require an initial submission fee and annual fee of $500.00 for surface disturbance of 50 or less acres, or a $1,000.00 fee for surface disturbance greater than 50 acres (see page six Section III, Rule R647-4-106.3 for estimated disturbance calculation). The appropriate fee MUST accompany this application or it cannot be processed by the Division.

PLEASE NOTE: If you are expanding from a small mining operation to a large mining operation, the appropriate large mine permit fee, less the annual $150.00 small mine fee (if already paid) MUST accompany this application.

XI. SIGNATURE REQUIREMENT

I hereby certify that the foregoing is true and correct. **(Note: This form must be signed by the owner or officer of the company/corporation who is authorized to bind the company/corporation).**

Signature of Permittee / Operator/Applicant:_____

Name (typed or print): _____

Title/Position (if applicable): _____

Date: _____

PLEASE NOTE:

Section 40-8-13(2) of the Mined Land Reclamation Act provides for maintenance of confidentiality concerning certain portions of this report. Please check to see that any information desired to be held confidential is so labeled and included on separate sheets or maps.

Only information relating to the location, size or nature of the deposit may be protected as confidential.

Confidential Information Enclosed: ( ) Yes ( ) No

Attachment I

Vegetation Cover Sampling

Vegetation cover sampling determines the amount of ground that is covered by live vegetation. It is divided into four categories which equal 100 percent. They are:

Vegetation - This is the live perennial vegetation. Care should be taken to avoid sampling in disturbed areas that have a large percentage of annual or weedy vegetation, such as cheatgrass and russian thistle.

Litter - This is the dead vegetation on the ground, such as leaf and stem litter.

Rock/rock fragments - This is the rock and rock fragments on the soil surface.

Bare ground - This is the bare soil which is exposed to wind and water erosion.

Cover Sampling - The following methods are acceptable:

Ocular Estimation

This method visually estimates the percentage of ground covered in a plot by the four components. Plot size is usually a meter or yard square or a circular plot 36 inches in diameter. Ten to twenty plots should be randomly sampled in each major vegetation type.

Line Intercept

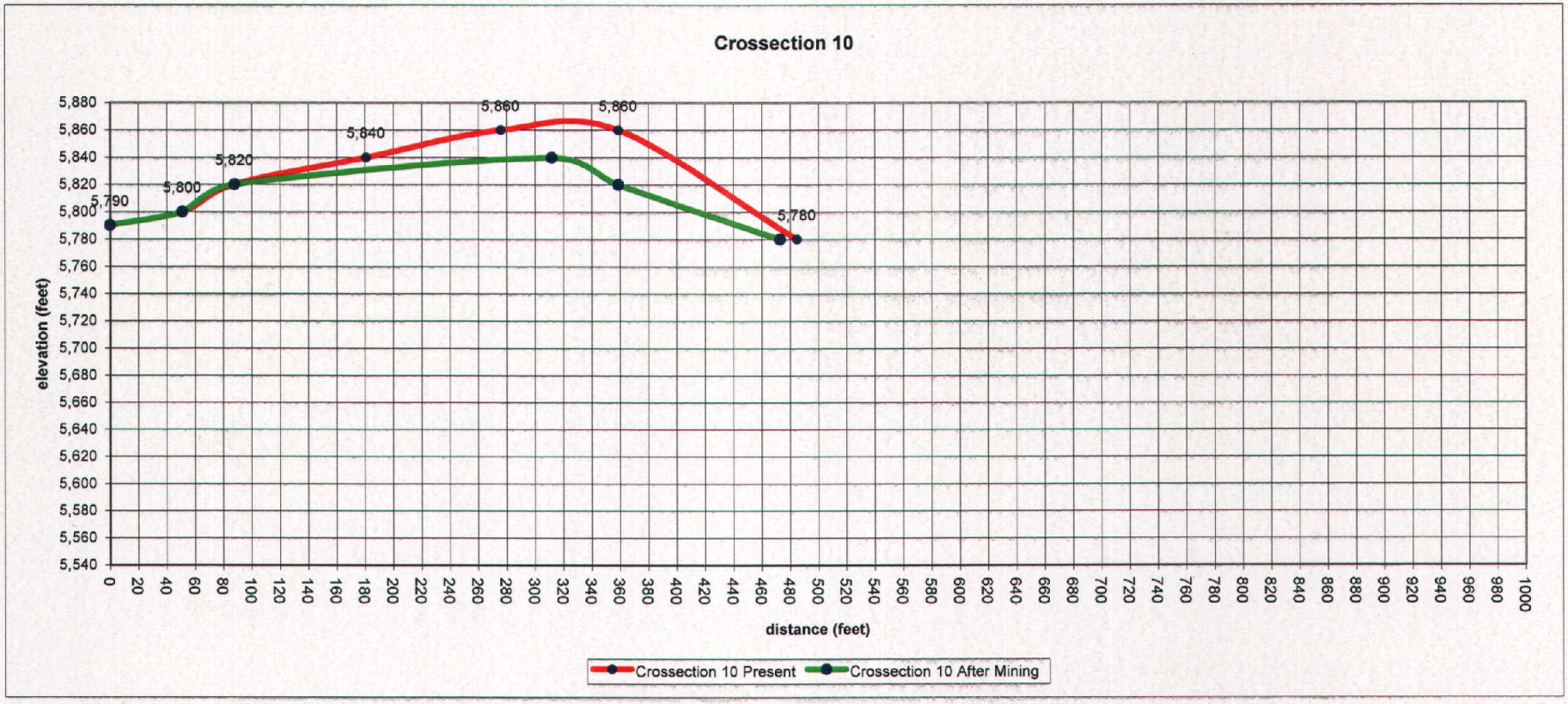
Percent ground cover is obtained by stretching a tape measure (usually 100') over the ground and then recording which of the four components is under each foot mark. At least ten of these transects should be randomly laid out and measured in each major vegetation type.

Soil Survey and Sampling Methods

If a Natural Resource Conservation Service or land management agency soil survey is not available, the Permittee / Operator shall delineate all soil types that will be disturbed by mining on a map. Each soil type shall be sampled for its characteristics and inherent properties. Representative sampling locations should have similar geologic parent material, slopes, vegetative communities and aspects. The sampling locations should be representative of the soil type and be identified on the map. Sampling shall be at a minimum of one for each soil type disturbed.

The soil map needs to be of sufficient scale so that each soil type can be accurately located on the ground.

Crossection 10 Present			Crossection 10 After Mining		
pt. no.	transect distance (feet)	pre-mining/existing elevations (feet)	pt. no	transect distance (feet)	After Mining Elevations (feet)
1	0	5,790	1	0	5,790
2	51	5,800	2	51	5,800
3	88	5,820	3	88	5,820
4	181	5,840	4	312	5,840
5	276	5,860	5	359	5,820
6	359	5,860	6	473	5,780
7	485	5,780	7		



2nd REVIEW OF NOTICEOF INTENTION
TO COMMENCE LARGE MINING OPERATIONS
Interstate Brick Company
Black Shale and Rose Mine
M/049/0084
October 19, 2012

R647-4-104 - Filing Requirements and Review Procedures

Comment #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
1	Page 23	The previous review contained the following comment which has not been addressed: "Gerald Gunning (signor [sic]) is not identified as an officer of the company as per the Utah Division of Corporations. Please have an appropriate officer sign the form, or provide us with a letter signed by an officer which grants Mr. Gunning the authority to sign."	lk	

R647-4-105 - Maps, Drawings & Photographs

105.3 - Drawings or Cross Sections (slopes, roads, pads, etc.)

Comment #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
2	Cross section 10	Cross section 10 is labeled as 9; please correct. Use 2013 01 Black Shale MR-REV Appendix 2 Cross sections Rev 2	lk	✓

R647-4-106 - Operation Plan

106.5 - Existing soil types, location, amount

Comment #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
3	Page 6	Please include a 'Total' line for the 'location of topsoil storage areas' table on the top of page 6.	lk	✓
4	Page 11	13 inches of soil over 25.6 acres would require approximately 44,800 cubic yards of soil. This does not match the 23,595 cubic yards of soil to be salvaged as identified at the bottom of this page, or under 106.6 on page 12.	lk	✓
5	Page 12	Please include a column showing volume of topsoil in each pile identified on this table.	lk	✓

divided it out & got to 8"

R647-4-109 - Impact Assessment

109.4 - Slope stability, erosion control, air quality, safety

Comment #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action

Comment #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
6	Page 18, para 5	Please correct the following statement: "Re-seeding will restore the vegetation to the natural surrounding state so there will be adverse impact." The Division assumes this is a typographical error and that there would be no adverse impact. Reseeding is not likely to restore the vegetation to the natural surrounding state, so the general statement should also be modified. It is more likely that reseeding will restore the site to an ecologically stable condition suitable for the postmining land use.	PNB	✓

110.5 - Revegetation planting program

Comment #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
7	Pages 19-20	Top soil replacement depth is stated to be 13.5 inches, but there are only 23,595 cubic yards of topsoil identified as being salvaged. This amount is sufficient for only 13 acres of disturbance, not the entire 25.6 acres as identified. What will be used on the remaining half of the mine disturbance?	lk	✓

R647-4-113 – Surety

Comment #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
8	Total Costs, App 5, p2/10	Since the reclamation costs are in terms of 2011 dollars, you can either escalate out four years to 2016, or the line item costs can be changed to 2012 dollars and escalated out five years to 2017. Alternatively, the observed (actual) escalation factor for 2011 of 1.2% could be applied to approximate the 2012 total costs, which costs could then be escalated out five years with the projected escalation factor of 1.2% until 2017.	PNB ✓	
9	Total Costs, App 5, p2/10	Change the projected escalation factor from 3.8% to 1.2%.	PNB ✓	
10	Earthwork Cost Summary, App 5, p3/10	The Division isn't currently able to verify the costs in the line items representing the combined equipment work to re-topsoil the mine areas identified. For each of the areas to be re-topsoiled, please include a separate line item for each of the equipment operations (loading, hauling, spreading, and roughening/ripping?). In cases where multiple piles are the source of growth medium for a specific area to be re-topsoiled, a separate haulage cost line and the associated production worksheet for the volume of material to be moved need to be included for each haulage route (since volumes, distance, and cycle times change).	PNB ✓	
11	Earthwork Cost Summary, App 5, p3/10	Indicate the final destination of the growth medium stored in 4-#5. It is assumed that some of it might be intended for some area besides area 6-#1.	PNB ✓	
12	Earthwork Cost Summary, App 5, p3/10	Change the acreage to be ripped. The NOI indicates it to be 6.8 acres rather than 7.8 acres.	PNB ✓	

Comment #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
13	Earthwork Cost Summary, App 5, p3/10	It appears that slopes in the areas of some parts of the connecting road are steeper than 2H:1V, which is too steep for a dozer to rip parallel to the contour. Some amount of the total 6.8 acres cannot be ripped (500 to 600 feet of the road?) if the approximate original contour is restored. However, the process of recontouring with a trackhoe can be used to prepare the seedbed in these areas, and bonding for ripping in cut and fill areas isn't needed.	PNB ✓	added 4 more hrs of track hoe time pg.
14	Revegetation Cost Summary, Appendix 5 page 10/10	The total cost listed for revegetation does not consider all of the areas identified in the plan as needing to be seeded. Seeding costs for both the existing and new growth media stockpiles need to be included. Also the current total does not include the costs of all of the listed areas.	PNB ✓	added other items.
15	Efficiency Worksheets (except Loader)	The volume of growth medium to be loaded, moved, and spread (17,000 cubic yards) is not enough to cover all of the planned areas with 13.5 inches of material. This appears to be the amount from the existing stockpiles, and not the new stockpiles. On Page 20 of the NOI, the reclamation plan indicates that the full 23,595 cubic yards of material will be spread over 13 acres.	PNB ✓	
16	Loader Time Estimate	The note on this page indicates that the loader will be used to spread soil on benches, and refers to the Reclamation Treatments Map. No areas of benches are identifiable on the maps, and the NOI text doesn't mention benches. Is the loader to be used for topsoiling benches in the possible highwall area of the Rose mine? Clarify the purpose of using the loader in reclamation, remove this page, or otherwise correct.	PNB removed	
17	Dump Truck Time Estimate	For each of the haul routes to move growth medium, a time estimate sheet identifying the haul distance and travel time should be included so that the Division can verify the costs provided. Currently, there is no clear link between these efficiency worksheets and the Earthwork Cost Summary sheet.	PNB ✓	see Turvey sheet w table
18	Dozer Time Estimate	It appears that the dozer work included in the cost calculation will be to spread growth medium. The reclamation plan on page 20 of the text of the NOI does not mention a dozer, and indicates that a trackhoe will be used to redistribute topsoil and to contour them, roughen and rake the loose soil, and that furrows will be left perpendicular to the slope of the hill. An efficiency sheet or equipment time sheet for redistributing (placing) the transported growth medium needs to be provided, and line items included in the Earthwork Cost Summary sheet. Commonly this work is done with a dozer, followed by ripping, but could be done with an excavator. Either way, time for any of these activities needs to be included. A separate time sheet is available for ripping time calculation if needed.	PNB	added dozer text to NOT included in tables
19	Dozer Time Estimate	The production for the dozer for the dozing distance identified in the CAT Handbook table appears to be 400 cubic yards/hour instead of the reported 1400 cubic yards/hour. Clarify and correct as needed.	PNB ✓	
20	Dump Truck Time Estimate	Two copies of the same dump truck time estimate have been provided. Different sheets are needed for each haul route.	PNB ✓	

Interstate Brick Black Shale Mine MR-REV

Appendix 5

Reclamation Cost Estimate
& Bonding Requirement

Table of Contents

References:

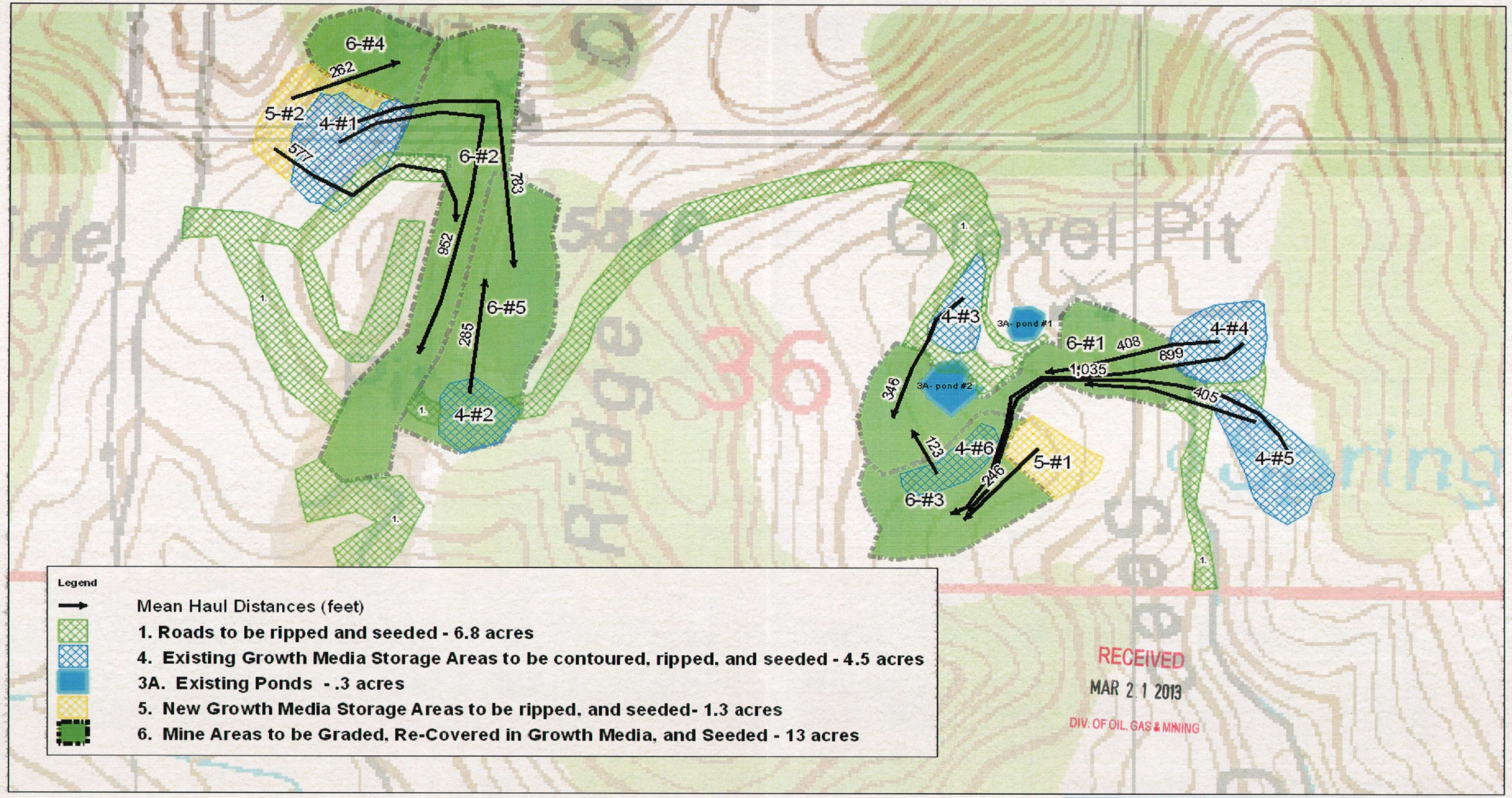
Machine Productivity: Caterpillar Performance Handbook Edition 33

Handbook for Calculation of Reclamation Bond Amounts, US Department of Interior, Office of Surface Mining, 4/2000

Bonding Calculations

Direct Costs			
Subtotal Demolition and Removal		$0	
Subtotal Backfilling and Grading (Earthwork)		$144,706	
Subtotal Revegetation		$26,000	
Direct Costs		$170,706	
Indirect Costs			
Mob/Demob		$17,071	10.0%
Contingency		$8,535	5.0%
Engineering Redesign		$4,268	2.5%
Main Office Expense		$11,608	6.8%
Project Mainagement Fee		$4,268	2.5%
Subtotal Indirect Costs		$45,750	26.8%
Total Cost		$216,456	
number of years			5
escalation factor			**1.2%**
Escalation		$4,704	
Reclamation Cost Escalated		$221,160	
Bond Amount (rounded to nearest $1,000)		$221,000	
	2016		

Earthwork Cost Summary and Total	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Loading, Hauling, and Spreading topsoil over area 6-#1- from topsoil stoarage areas 4-#3, 4-#4, 4-#5, and 4-#6	$42,165	$246	0.1	$188	$722	5	$934	$/hr	11,802	CY	355	CY/hr	122	Hr.	$38,343
Loading, Hauling, and Spreading topsoil over 3.8 acre mine area 6-#2 from topsoil storage areas 4-#1, and 5-#2	$42,165	$246	0.1	$188	$722	5	$934	$/hr	12,059	CY	390	CY/hr	100	Hr.	$31,524
Loading, Hauling, and Spreading topsoil over 2.1 acre mine area 6-#3 from topsoil storage area 4-#4, 4-#5, and 5-#1	$42,165	$246	0.1	$188	$722	5	$934	$/hr	6,606	CY	367	CY/hr	107	Hr.	$33,772
Loading, Hauling, and Spreading topsoil over 1.1 acre mine area 6-#4 from topsoil storage area 5-#2	$42,165	$246	0.1	$188	$722	5	$934	$/hr	4,859	CY	443	CY/hr	25	Hr.	$7,855
Loading, Hauling, and Spreading topsoil over 3.2 acre mine area 6-#5 from topsoil storage area 4-#1 and 4-#2	$42,165	$246	0.1	$188	$722	5	$934	$/hr	11,571	CY	390	CY/hr	85	Hr.	$26,749
Restoring Cut and Fill Connector Road to Original Contour	$11,725.00	$82.60	10%	$67.75	$231.89	1	$231.89	$/hr	1,111	CY	295	CY/hr	4	Hr.	$1,856
Ripping 6.8 acres of road area, 18" deep, for seed bed preparation. D8N dozer	$18,315	$86	0.1	$68	$181	1	$181	$/hr	18,876	CY	742	CY/hr	25	Hr.	$4,607
Subtotals and averages									66,884	CY	426	CY/hr	468	Hr.	$144,706



T. 6 S., R., 1 W., SLBM
SE 1/4, Sec. 36
Soilders Pass,
USGS 7.5 minute Quad Map
Scale 1:5,000

N
W E
S

0 25 50 100 150 200
Meters

0 125 250 500 750 1,000
Feet

Interstate Brick
Black Shale Mine MR-REV
RECLAMATION TREATMENTS MAP

Initial volumes of topsoil piles

topsoil application area	CY of topsoil
4-#1	4,981
4-#2	1,660
4-#3	1,557
4-#4	2,936
4-#5	3,162
4-#6	1,958
5-#1	2,447
5-#2	4,894
	23,595

Information for Dept of topsoil coverage									Informtion for Cost Calculatoins			
	Earthmoving task no.	Topsoil Redistribution Area	Topsoil Pile	CY of source pile	% of pile to be used for this area	CY used for area	Acres to spread topsoil over	avg. dept. of coverage over area (inches)	Mean Haul Distance (feet)	Transport time. (minutes)*	Return Time (empty) (minutes)*	total hauling time (hours)
Black Shale side of mine	1	6-#1	4-#3	1,557	100%	1,557			346	0.8	0.4	10
East side of Enoch Ridge	2		4-#4	2,936	50%	1,468			408	1	0.5	10
	3		4-#5	3,162	60%	1,897			405	1	0.5	12
	4		4-#6	1,958	100%	1,958			123	0.2	0.2	12
						6,880	2.8	**18**				
	5	6-#3	4-#4	2,936	50%	1,468			899	2	1.2	10
	6		4-#5	3,162	40%	1,265			1035	1.7	1.2	15
	7		5-#1	2,447	100%	2,447			246	0.5	0.5	15
						5,180	2.1	**18**				
Rose Side of Mine	8	6-#2	4-#1	4,981	40%	1,992			783	1.6	0.8	15
West side of Enoch Ridge	9		5-#2	4,894	70%	3,426			577	0.9	0.6	22
						5,418	3.8	**11**				
	10	6-#4	5-#2	4,894	30%	1,468			262	0.5	0.4	9
						1,468	1.1	**10**				
	11	6-#5	4-#1	4,981	60%	2,989			783	1.2	0.8	21
	12		4-#2	1,660	100%	1,660			285	0.5	0.4	10
						4,649	3.2	**11**				
						23,595	13.0	**13.5**				**158**

* a Grade of 6% was used in the chart of distance vs. time for the dump truck haul times

	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Loading, Hauling, and Spreading topsoil over area 6-#1- from topsoil stoarage areas 4-#3, 4-#4, 4-#5, and 4-#6															
Loading from pile 4-#3- Cat 336DL Track Hoe	$11,725.00	$82.60	0.1	$67.75	$231.89	1	$231.89	$/hr	1,557	CY	295	CY/hr	10	Hr.	$2,319
Hauling from pile 4-#3- Cat 735 Articulated dump truck	$12,125.00	$76.90	0.1	$52.25	$212.62	2	$425.24	$/hr	1,557	CY	326	CY/hr	10	Hr.	$4,252
Loading from pile 4-#4- Cat 336DL Track Hoe	$11,725.00	$82.60	0.1	$67.75	$231.89	1	$231.89	$/hr	1,468	CY	295	CY/hr	10	Hr.	$2,319
Hauling from pile 4-#4- Cat 735 Articulated dump truck	$12,125.00	$76.90	0.1	$52.25	$212.62	2	$425.24	$/hr	1,468	CY	326	CY/hr	10	Hr.	$4,252
Loading from pile 4-#5- Cat 336DL Track Hoe	$11,725.00	$82.60	0.1	$67.75	$231.89	1	$231.89	$/hr	1,897	CY	295	CY/hr	12	Hr.	$2,783
Hauling from pile 4-#5- Cat 735 Articulated dump truck	$12,125.00	$76.90	0.1	$52.25	$212.62	2	$425.24	$/hr	1,897	CY	326	CY/hr	12	Hr.	$5,103
Loading from pile 4-#6- Cat 336DL Track Hoe	$11,725.00	$82.60	0.1	$67.75	$231.89	1	$231.89	$/hr	1,958	CY	295	CY/hr	12	Hr.	$2,783
Hauling from pile 4-#6- Cat 735 Articulated dump truck	$12,125.00	$76.90	0.1	$52.25	$212.62	2	$425.24	$/hr	1,958	CY	326	CY/hr	12	Hr.	$5,103
Spreading & furrowing with rippers - Cat D8 Dozer	$18,315.00	$86.45	0.1	$67.75	$277.31	1	$277.31	$/hr	6,880	CY	709	CY/hr	34	Hr.	$9,429
Totals and Averages	$42,165	$246	0.1	$188	$722	5	$934	$/hr	11,802	CY	355	CY/hr	122	Hr.	$38,343

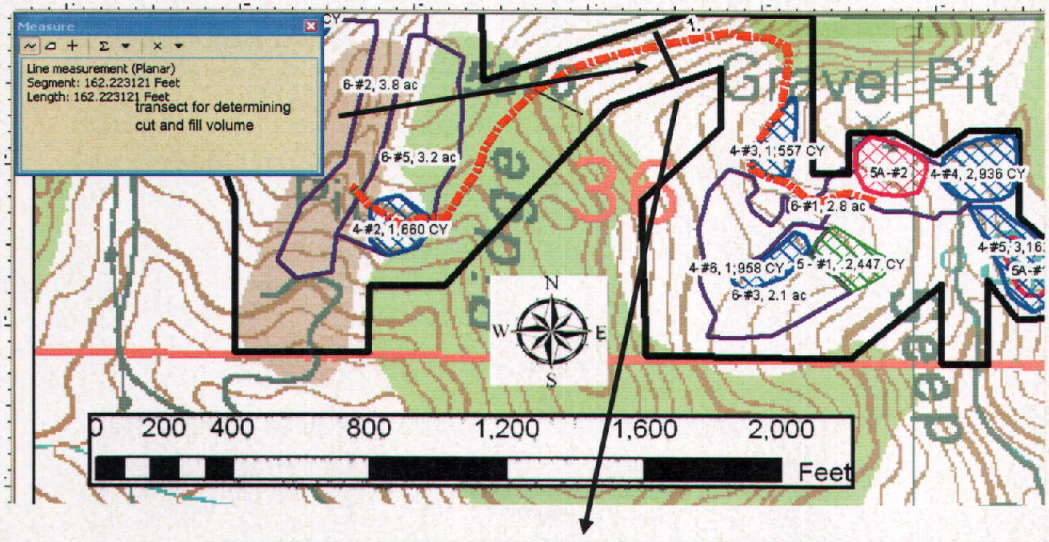
	Monthly Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Loading, Hauling, and Spreading topsoil over 3.8 acre mine area 6-#2 from topsoil storage areas 4-#1, and 5-#2															
Loading from pile 4-#1, - Cat 336DL Track Hoe	$11,725.00	$82.60	10%	$67.75	$231.89	1	$231.89	$/hr	1,992	CY	295	CY/hr	15	Hr.	$3,478
Hauling from pile 4-#1 - Cat 735 Articulated dump truck	$12,125.00	$76.90	10%	$52.25	$212.62	2	$425.24	$/hr	1,992	CY	326	CY/hr	15	Hr.	$6,379
Loading from pile 5-#2, - Cat 336DL Track Hoe	$11,725.00	$82.60	10%	$67.75	$231.89	1	$231.89	$/hr	3,426	CY	295	CY/hr	22	Hr.	$5,102
Hauling from pile 5-#2 - Cat 735 Articulated dump truck	$12,125.00	$76.90	10%	$52.25	$212.62	2	$425.24	$/hr	3,426	CY	326	CY/hr	22	Hr.	$9,355
Spreading & furrowing with rippers - Cat D8 Dozer	$18,315.00	$86.45	10%	$67.75	$277.31	1	$277.31	$/hr	6,641	CY	709	CY/hr	26	Hr.	$7,210
Totals and Averages	$42,165	$246	0.1	$188	$722	5	$934	$/hr	12,059	CY	390	CY/hr	100	Hr.	$31,524

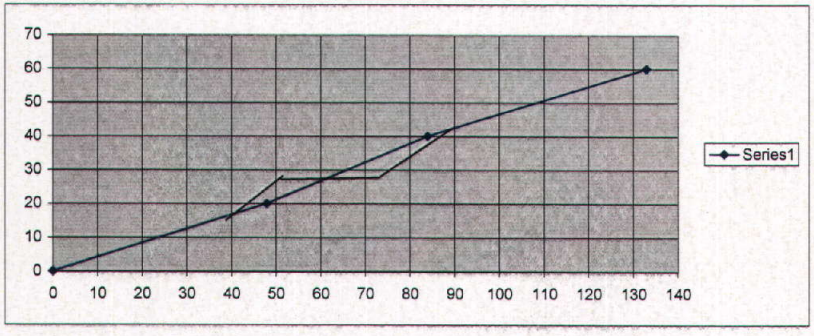
	Monthly Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Loading, Hauling, and Spreading topsoil over 2.1 acre mine area 6-#3 from topsoil storage area 4-#4, 4-#5, and 5-#1															
Loading from pile 4-#4, Cat 336DL Track Hoe	$11,725.00	$82.60	10%	$67.75	$231.89	1	$231.89	$/hr	1,468	CY	295	CY/hr	10	Hr.	$2,319
Hauling from pile 4-#4,- Cat 735 Articulated dump truck	$12,125.00	$76.90	10%	$52.25	$212.62	2	$425.24	$/hr	1,468	CY	326	CY/hr	10	Hr.	$4,252
Loading from pile 4-#5, - Cat 336DL Track Hoe	$11,725.00	$82.60	10%	$67.75	$231.89	1	$231.89	$/hr	1,265	CY	295	CY/hr	15	Hr.	$3,478
Hauling from pile 4-#5,- Cat 735 Articulated dump truck	$12,125.00	$76.90	10%	$52.25	$212.62	2	$425.24	$/hr	1,265	CY	326	CY/hr	15	Hr.	$6,379
Loading from pile 5-#1, - Cat 336DL Track Hoe	$11,725.00	$82.60	10%	$67.75	$231.89	1	$231.89	$/hr	2,447	CY	295	CY/hr	15	Hr.	$3,478
Hauling from pile 5-#1,- Cat 735 Articulated dump truck	$12,125.00	$76.90	10%	$52.25	$212.62	2	$425.24	$/hr	2,447	CY	326	CY/hr	15	Hr.	$6,379
Spreading & furrowing with rippers - Cat D8 Dozer	$18,315.00	$86.45	10%	$67.75	$277.31	1	$277.31	$/hr	3,670	CY	709	CY/hr	27	Hr.	$7,487
	$42,165	$246	0.1	$188	$722	5	$934	$/hr	6,606	CY	367	CY/hr	107	Hr.	$33,772

	Monthly Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Loading, Hauling, and Spreading topsoil over 1.1 acre mine area 6-#4 from topsoil storage area 5-#2															
Loading from pile 5-#2,- Cat 336DL Track Hoe	$11,725.00	$82.60	10%	$67.75	$231.89	1	$231.89	$/hr	1,468	CY	295	CY/hr	9	Hr.	$2,087
Hauling from pile 5-#2- Cat 735 Articulated dump truck	$12,125.00	$76.90	10%	$52.25	$212.62	2	$425.24	$/hr	1,468	CY	326	CY/hr	9	Hr.	$3,827
Spreading & furrowing with rippers - Cat D8 Dozer	$18,315.00	$86.45	10%	$67.75	$277.31	1	$277.31	$/hr	1,923	CY	709	CY/hr	7	Hr.	$1,941
	$42,165	$246	0.1	$188	$722	5	$934	$/hr	4,859	CY	443	CY/hr	25	Hr.	$7,855

	Monthly Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Loading, Hauling, and Spreading topsoil over 3.2 acre mine area 6-#5 from topsoil storage area 4-#1 and 4-#2															
Loading from pile 4-#1, - Cat 336DL Track Hoe	$11,725.00	$82.60	10%	$67.75	$231.89	1	$231.89	$/hr	2,989	CY	295	CY/hr	21	Hr.	$4,870
Hauling from pile 4-#2, - Cat 735 Articulated dump truck	$12,125.00	$76.90	10%	$52.25	$212.62	2	$425.24	$/hr	2,989	CY	326	CY/hr	21	Hr.	$8,930
Loading from pile 4-#2, - Cat 336DL Track Hoe	$11,725.00	$82.60	10%	$67.75	$231.89	1	$231.89	$/hr	1,660	CY	295	CY/hr	10	Hr.	$2,319
Hauling from pile 4-#2, - Cat 735 Articulated dump truck	$12,125.00	$76.90	10%	$52.25	$212.62	2	$425.24	$/hr	1,660	CY	326	CY/hr	10	Hr.	$4,252
Spreading & furrowing with rippers - Cat D8 Dozer	$18,315.00	$86.45	10%	$67.75	$277.31	1	$277.31	$/hr	5,593	CY	709	CY/hr	23	Hr.	$6,378
	$42,165	$246	0.1	$188	$722	5	$934	$/hr	11,571	CY	390	CY/hr	85	Hr.	$26,749

	Monthly Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Restoring Cut and Fill Connector Road to Original Contour															
Loading - Cat 336DL Track Hoe	$11,725.00	$82.60	10%	$67.75	$231.89	1	$231.89	$/hr	1,111	CY	295	CY/hr	4	Hr.	$928
using trackhoe to make furrows parrellel to contour on areas where slopes are too steep for a dozer - Cat 336DL Track Hoe	$11,725.00	$82.60	10%	$67.75	$231.89	1	$231.89	$/hr	1,111	CY	295	CY/hr	4	Hr.	$928
															$1,856





crossection points from topo map

length	height
0	0
48	20
84	40
133	60

Estimate 600 feet of road will be cut and filled

Estimate of cut and fill volume: 1,111 CY (1/2 x 20' wide x 5 ' tall x 600 ' long / 27 cf/CY)

	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Ripping 6.8 acres of road area, 18" deep, for seed bed preparation. D8N dozer	$18,315.00	$86.45	0.1	$67.75	$181.10	1	181.1	$/hr	18876	CY	742	CY/hr	25	Hr.	$4,607
rippers															
	$18,315	$86	0.1	$68	$181	1	$181	$/hr	18,876	CY	742	CY/hr	25	Hr.	$4,607

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Area	Unit	Quantity	Unit	Cost	
	Revegetation Black Shale/Rose										
	Seeding Mining Area 6-#1			1000	AC	2.8	AC	2.8	MSF	$2,800	6.8
	Seeding Mining Area 6-#2			1000	AC	3.8	AC	3.8	MSF	$3,800	4.5
	Seeding Mining Area 6-#3			1000	AC	2.1	AC	2.1	MSF	$2,100	1.3
	Seeding Mining Area 6-#4			1000	AC	1.1	AC	1.1	MSF	$1,100	1.3
	Seeding Mining Area 6-#5			1000	AC	3.2	AC	3.2	MSF	$3,200	13.9
	Seeding Road Area 1A			1000	AC	6.8	AC	7.8	MSF	$7,800	
	Topsoil pile pad 4-#1			1000	AC	1.2	AC	1.2	MSF	$1,200	
	Topsoil pile pad 4-#2 (included in mine area 6-#5)			1000	AC	0	AC	0	MSF	$0	
	Topsoil pile pad area 4-#3			1000	AC	0.4	AC	0.4	MSF	$400	
	Topsoil pile pad area 4-#4			1000	AC	0.8	AC	0.8	MSF	$800	
	Topsoil pile pad area 4-#5			1000	AC	1.1	AC	1.1	MSF	$1,100	
	Topsoil pile pad area 4-#6 (included in mine area 6-#3)			1000	AC	0.4	AC	0.4	MSF	$400	
	Topsoil pile pad area 5-#1			1000	AC	0.6	AC	0.6	MSF	$600	
	Topsoil pile pad area 5-#2			1000	AC	0.7	AC	0.7	MSF	$700	
						25	AC				
	Total									$26,000	

Black Shale MR-REV Appendix 5 Page 14/16 : Track Hoe time estimate

For loading stockpiled soil material into a dump truck to be taken and redistributed over area shown as item 105.3 (a) 8 on Reclamation Treatments Map.
This calulation used for loading from piles 105.3 (a) 4 and 105.3 (a) 5 on Reclamation Treatments Map.

this sheet based on and References: Caterpillar Performance Handbook, Edition 33, & Handbook for Calculation of Reclamation Bond Amounts, US Department of the Interior, Office of Surface Mining, 4/5/00

from Workesheet 10, page A-12, Handbook for Calculation of Reclamaiton Costs, Productivity for Hydraulic Excavator Use (Backhoe or Power Shovel).

Caterpillar 345 Track Hoe

Net Bucket Capacity = 2.4 LCY (heaped bucket capacity, pg. 4-16, Cat handbook, used avg of 1.91 to 2.87 yd3) x 0.9 (bucket fill factor, see page 4-132 Cat handbook for hard, tough clay.) = 2.16 LCY

Hourly Production = (2.16 minutes net bucket capacity x 60 min/hour) / (0.33 cycle time. See page 4-179, Cat handbook.) x 0.75 efficiency factor (page 18, Surface mining handbook) = 295 LCY/hr

Hours Required = 23,595 volume to be handled / 295 LCY/hr net hourly production = **80.1 hrs**

Black Shale MR-REV Appendix 5 Page 15/16 : Dump Truck time estimate

from Workesheet 9, page A-11, Handbook for Calculation of Reclamaiton Costs, Productivity and Hours Required for Truck Use.

this sheet based on and References: Caterpillar Performance Handbook, Edition 33, & Handbook for Calculation of Reclamation Bond Amounts, US Department of the Interior, Office of Surface Mining, 4/5/00

Caterpillar 769C Dump Truck

from pg. 10-3, Cat Handbok 11, 740 Truck, 21.6 yd3 struck, 28.6 yd3 heaped, 25.1 avg.

No. Loader Passes / Truck = Truck Capacity **25.1** Loose Cubic Yards, LCY / Loader bucket capacity (see **2.16** LCY = **12** passes (rounded to nearest whole number)

Net Truck Capacity = **2.16** LCY (Loader bucket capacity (see worksheet 10) productivity for hydraulic excavator (Cat 450)) x **12** (Loader passes per truck) = **25.1** LCY

Loading Time/Truck = **0.33** minutes (Loader cycle time (see worksheet 10, productivity for hydraulic excavator (Cat 450)) x **12** (Loader passes per truck) = **3.83** minutes

Truck Cycle Time = **0.8** minutes (Haul time) + **0.4** minutes (return time) + **3.83** minutes (loading time) + **2** minutes (dump and manuever time) = **7.03** minutes

see pg. 9-14 Cat handbook, distance vs. time vs. grade graph for this truck

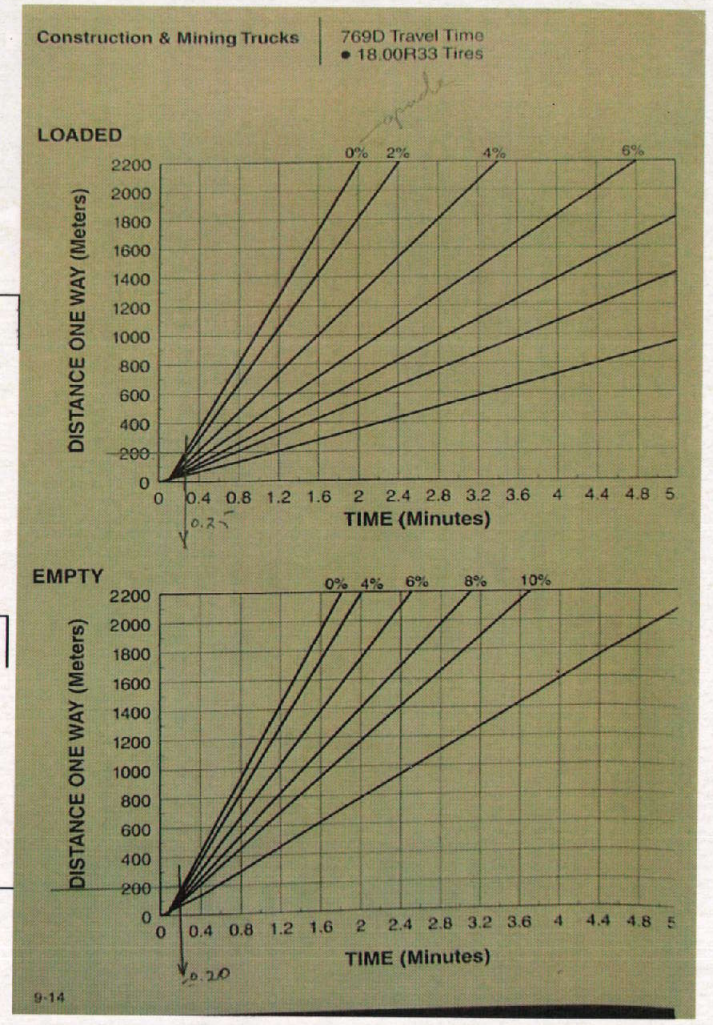
from Cat Handbook pg. 9-9

Production Rate = **25.1** LCY (Net truck capacity) x **1** (no. trucks) / **7.03** (Truck Cycle time) = **3.57** LCY / minute

Hourly Production = **3.57** LCY / minute (Production Rate) x 60 min/hr. x **0.75** (efficiency factor) = **161** LCY / hour

page 18, Surface mining handbook

Hours Required = **1,557** LCY (Volume of material to be moved) / **161** LCY/hr (Hourly Production) = **10** **hours**



topsoil hauling task	Hauling topsoil from top soil pile no.	and spreading it over area (labeled in Rec. Treats map)	Mean hauling distance (feet) (see map)	time to haul material to area (substituted into worksheet above)	return time (min.) (substituted into worksheet above)	amount of material to be hauled (substituted into worksheet above)	total time to haul material (hours)	
1	4-#3	6-#1	346	0.8	0.4	1,557	10	the numbers for this task are shown in sheet above.
2	4-#4	6-#1	408	1	0.5	1,468	10	
3	4-#5	6-#1	405	1	0.5	1,897	12	
4	4-#6	6-#1	123	0.2	0.2	1,958	12	
5	4-#4	6-#3	899	2	1.2	1,468	12	
6	**4-#5**	6-#3	1035	1.7	1.2	1,265	10	
7	5-#1	6-#3	246	0.5	0.5	2,447	15	
8	4-#1	6-#2	783	1.6	0.8	1,992	15	
9	5-#2	6-#2	577	0.9	0.6	3,426	22	
10	5-#2	6-#4	262	0.5	0.4	1,468	9	
11	4-#1	6-#5	783	1.2	0.8	2,989	21	
12	4-#2	6-#5	285	0.5	0.4	1,660	10	
						23,595	156	total time (hrs.) to spread topsoil over area

Black Shale MR-REV Appendix 5 Page 16/16 : Dozer time estimate

this sheet based on and References: Caterpillar Performance Handbook, Edition 33, & Handbook for Calculation of Reclamation Bond Amounts, US Department of the Interior, Office of Surface Mining, 4/5/00

CATERPILLAR D8R - SEMI U

Operating Adjustment Factor = [0.75] x [1] x [0.75] x [0.9]

- 0.75: operator factor pg. 1-42, Cat handbook, .75 "average", .6 "poor".
- 1: material factor pg. 1-42 Cat handbook. 1.2 - loose stockpile .8 - hard to cut frozen w/tilt cyl. Use .7 w/o tilt. .6-.8 - rock, ripped or blasted.
- 0.75: efficiency factor. Use .75 "unfavorable or night" conditions for crawler equip.. Pg. 18, Reclamation Handbook.
- 0.9: grade factor. From chart 1-42 Cat handbook. At right

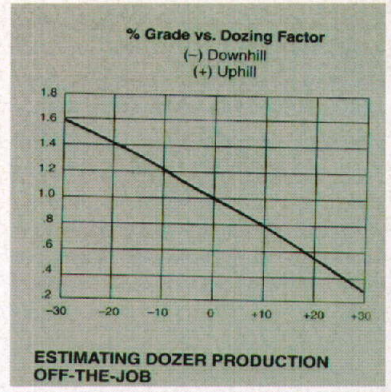
x [1] x [1] x [1] x [1] = 0.50625

- 1: weight correction factor
- 1: production method / blade factor
- 1: visibility factor use .8 for dust, rain, snow, fog, or darkness
- 1: elevation factor

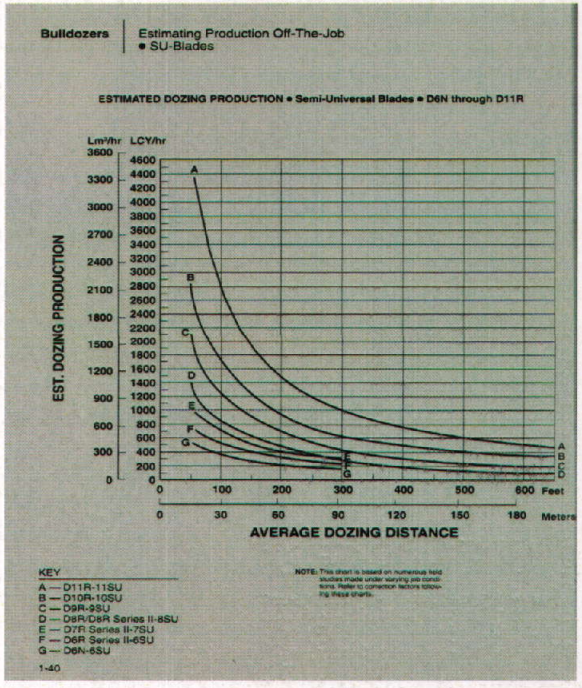
Net Hourly Production = [400] LCY/hr x [0.50625] = 202.5 LCY/hr

- 400: normal hourly production (pg 1-40, Cat Handbook). See right
- 0.50625: operating adjustment factor

Hours Required = [23,595] LCY (volume to be moved) / [203] LCY/hr (net hourly production) = 116.5 hrs



ESTIMATING DOZER PRODUCTION OFF-THE-JOB



time estima

topsoil hauling task	Hauling topsoil from top soil pile no.	and spreading it over area (labeled in Rec. Treats map)	amount of material to be hauled (substituted into worksheet above)	total time to haul material (hours)
1-4	4-#3, 4-#4, 4-#5, 4-#6	6-#1	6,880	34
5-7	4-#4, 4-#5, 5-#1	6-#3	5,180	26
8 & 9	4-#1, 5-#2	6-#2	5,418	27

the numbers for this task are shown in sheet above.